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A NEW FOSSIL ZALAMBDODONT INSECTIVORE

BY ERICH MAREN SCHLAIKJER[1]

In 1903, Dr. W. D. Matthew described a partially complete left lower jaw of a fossil zalambdodont insectivore which he named *Apternodus mediaevus*. In 1910 he gave a brief description (pp. 33–36) of an unusually complete skull and left lower jaw which he referred to the same genus and species. In my recent study of a new fossil zalambdodont, *A. gregoryi*, I mentioned that I had not had the opportunity of studying this very fine specimen. It was in the University of Wyoming Museum but was reported as lost. Since that time, fortunately, it has been found and has been acquired by The American Museum of Natural History. The specimen presents a sufficient number of peculiar characteristics, not mentioned by Dr. Matthew, to warrant an additional description. Also, since Dr. Matthew's paper, enough information about this genus has been brought to light by the discovery of new material to determine this specimen as representing a species different from those previously described.

Through the courtesy of Dr. G. G. Simpson, the specimen has very generously been offered to me for reëxamination, by the Department of Vertebrate Palaeontology of the American Museum. The results of this study are the subject of this article. The drawings were made by Mrs. H. Ziska.

Order **INSECTIVORA**

Family **SOLENODONTIDAE**

Subfamily **Apternodontinae**

Apternodus brevirostris, sp.nov.

TYPE.—Amer. Mus. No. 22466. Nearly complete skull and left lower jaw. Collected by Mr. W. H. Reed for the University of Wyoming.

HORIZON AND LOCALITY.—Lower Oligocene, *Titanotherium* beds. Collected in the neighborhood of Bates's Hole, north of the Laramie Plains, Wyoming.

SPECIFIC CHARACTERS.—The type material of *A. mediaevus* being so fragmentary, I deemed it advisable in my description of *A. gregoryi* to consider only those characters as specific which were different from those seen in *A. mediaevus*. They were as follows: jaw larger and more massive; coronoid heavier, more antero-posteriorly

[1]Museum of Comparative Zoology, Cambridge, Massachusetts.

expanded, and more external to the tooth row; M_{2-3} series longer; M_2 shorter, wider and heavier, talonid more reduced and paraconid more lingually situated with respect to the metaconid; M_3 longer and slightly higher and talonid larger; and mandibular condyle much wider and heavier. All of these characters in *A. brevirostris* are intermediate between those of *A. mediaevus* and *A. gregoryi*. The differences, then, among

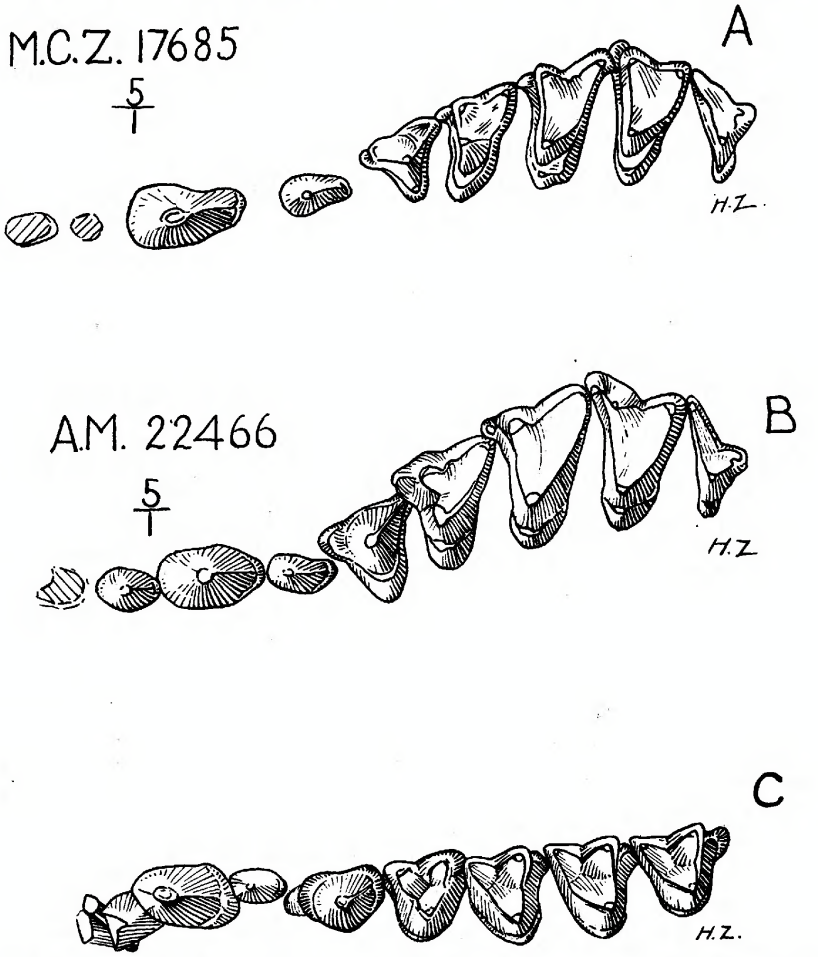

Fig. 1. A, left upper cheek-teeth of *Apternodus gregoryi* Schlaikjer. M. C. Z. 17685. B, left upper cheek-teeth of *A. brevirostris*, new species. A.M. 22466. C, left lower cheek-teeth of *A. brevirostris*, new species. A.M. 22466. All drawings five times natural size.

these three species, so far as the posterior part of the lower jaw with the last two molar teeth is concerned, seem to be one of degree. While, on the basis of the characters listed above, *A. brevirostris* and *A. gregoryi* appear to be rather closely similar, they are strikingly different in many skull characters. It would seem, therefore, that those differences in the last two inferior molar teeth which appear to be minor in

importance are of greater specific value than would normally be inferred. The more important characters in which *A. brevirostris* is different from *A. gregoryi* are the following: 1. Postorbital region much longer. 2. Face in front of antorbital bar shorter. 3. Auditory region more widely expanded, especially across the region of the post-glenoid processes. 4. Auditory plate of greater antero-posterior length, and does not descend as sharply along the dorso-anterior margin. 5. Skull higher above M^1. 6. Palate proportionately broader across Ms^1. 7. Constriction of the face across the maxillaries from M^1 to C more abrupt. 8. No diastema between the last upper incisor and the canine, or between the canine and P^2 or between P^2 and P^3. 9. Upper canines smaller. 10. P^4 larger. 11. Protocones (especially on M^1) conical, and much larger than hypocones. 12. M^{1-2} longer and wider. 13. P_3 with continuous external cingulum. 14. Condyle of lower jaw much narrower. 15. Anterior region of mandible deeper.

DESCRIPTION

Dentition

The incisor formula of *Apternodus* has never been definitely known. The anterior tips of the premaxillaries are broken away, hence the exact number of upper incisors cannot be determined. It is very probable, however, that there were only two. They are single-rooted and the last is closely set against the canine. As in *A. gregoryi* the canine is two-rooted, though proportionately smaller and not as tall-crowned. P^2 is two-rooted and not one-rooted as stated by Matthew. The rest of the upper cheek-teeth are similar to those of *A. gregoryi*, though they present a number of differences of proportions. Especially noteworthy is the large size of P^3, and the conical protocones which are larger than the hypocones.

The most striking dental feature of this specimen is the presence of a very minute second lower incisor tooth which is wedged between the enlarged semi-procumbent first incisor and the fairly large I_3. The lower incisor formula can now be considered definitely as I_3. I_2 is peg-like, and is so small that it can scarcely be seen with the naked eye. Its alveolus is confluent with that of I_1 which is the largest of the incisors. I did not record the presence of this tooth in *A. gregoryi*. Since my study of that species, I have reëxamined the specimen, and by excavating in the mandible just posterior to the enlarged incisor I discovered the tip of a minute tooth root. I_2, therefore, was also present in this species. The crown of I_1 is broken away, but the root indicates that the tooth was oval in outline, being somewhat laterally compressed. I_3 is smaller than I_1, and the crown is low, oval and flat. The reduction of I_2 instead of I_1 or I_3 is a unique character. I am aware of this condition in no other zalambdodont, and its occurrence is most unusual among other mammals.

Another character of *Apternodus*, equally unique among zalambdodonts, is the enlargement of I_1. This is probably the result of the reduction of I_2, which is ordinarily the larger incisor in this group of insectivores.

Skull

The facial portion of the skull is strikingly abbreviated, while the postorbital area is very much elongated. There is a slight postorbital constriction as in *A. gregoryi*, but the skull is higher above M^1 and the palate is proportionately broader across the first molars. Also, the constriction of the face from M^1 to the canine is more abrupt and the malar projection on the maxillary is much more prominent. The depression on the maxillary dorso-anteriorly to the orbit is not pronounced, which indicates that the levator labii superioris proprius muscle probably was not well developed. There are a number of other differences of proportions in the two species.

The auditory plate and the basicranial region of this specimen are of special interest because the sutures are so clearly shown. The auditory plate is of greater antero-posterior length, and the dorso-anterior margin does not descend as sharply as in *A. gregoryi*. In *A. gregoryi*

Measurements of the Skull

	mm.
Exoccipital condyle to anterior border of canine	37.4
Height of occiput, basioccipital to top of sagittal crest	11.6
Height of skull above alveolus of M^1	12.6
Front of antorbital ridge to occipital condyle	33.0
Front of antorbital ridge to front of enlarged incisor	8.7
Greatest width across maxillaries above posterior of canines	8.0
Width across maxillaries on postero-exterior of Ms^1 alveoli	13.8
Length of tooth row, anterior of C to posterior of M^3 on alveoli	13.8
Anterior of C to P^4, inclusive, on alveoli	8.6
Length of C on alveolus	2.2
Greatest width of C	1.5
Greatest length of P^4	2.9
Width of P^4 at center of crown on alveolus	3.1
Greatest length of M^1	2.6
Width of M^1 at center of crown on alveolus	3.7
Greatest length of M^2	1.9
Width of M^2 at center of crown on alveolus	3.4
Greatest length of M^3	1.0
Greatest width of M^3	3.0
Glenoid cavity to occipital condyle	14.6

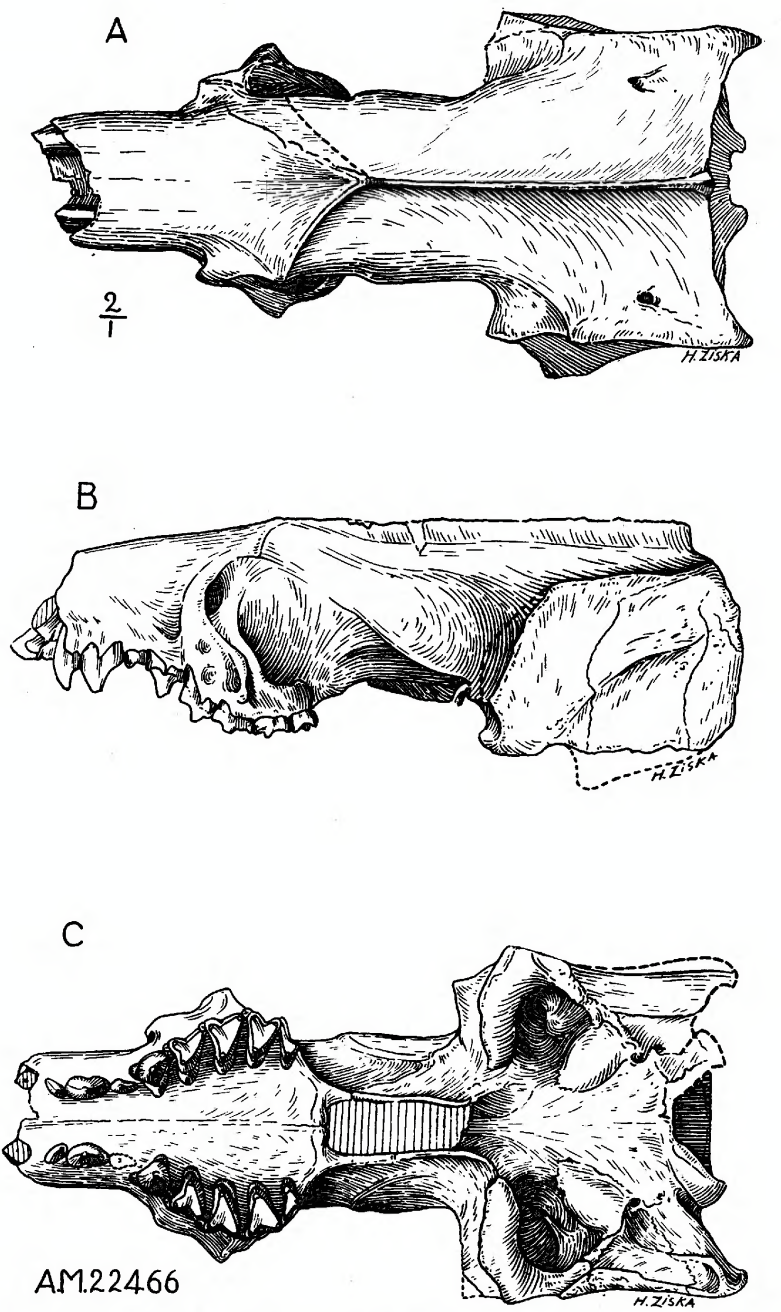

Fig. 2. *Apternodus brevirostris*, new species. A.M. 22466. A, dorsal; B, lateral; C, palatal views of the skull. Twice natural size.

this plate presents only one discernible suture. It is situated just in front of the posterior margin and I considered it to be between the squamosal and the mastoid portion of the periotic. It is now clear that this is the suture between the posterior border of the mastoid portion of the periotic and the exoccipital, the latter forming the posterior margin of the auditory plate. Farther forward on the plate is another suture which is between the squamosal and the mastoid portion of the periotic. The dorsal extensions of both sutures are obscure. It is now established that the mastoid does not enter into the formation of the lambdoid crest as I had previously supposed.

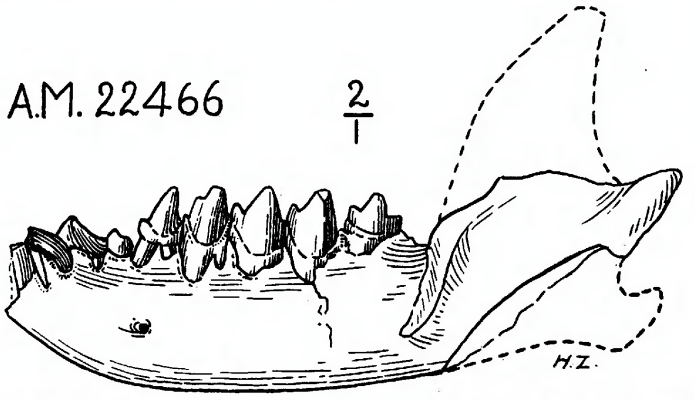

Fig. 3. *Apternodus brevirostris*, new species. A.M. 22466. External view of left ramus of the lower jaw. Twice natural size.

Mandible

Only the left lower jaw is preserved. The ascending ramus and the angle are lacking. The horizontal ramus is massively constructed and is noticeably heavier and deeper in the symphysial region than is that of *A. gregoryi*. The mandibular condyle is heavier though less broadly expanded than in *A. gregoryi*. In other respects the two specimens are much the same.

Measurements of the Jaw

	mm.
Posterior of I_1 (on alveolus) to condyle	25.3
Posterior of I_1 to M_3 on alveoli	14.2
M_{1-3} on alveoli	6.3
M_{2-3} on alveoli	4.0
Depth of jaw under center of M_2 (internal)	6.4
Posterior of M_3 to foramen mandibulare	5.6
Width of condyle	6.2

CONCLUSION

In 1910, Dr. Matthew suggested the subfamily name Apternodontinae to include the genus *Apternodus*. He also suggested that this subfamily be included in the family Tenrecidae (Centetidae). In my recent paper I proposed that the Solenodontidae should include this subfamily. That *Solenodon* is the living form which is most nearly related to *Apternodus* is, I believe, unquestionable. This conclusion may be drawn from the fact that *Apternodus* does not possess a single character common to any other zalambdodont which is not also common to *Solenodon*, and I have previously listed a large number of characters that are distinctive only of these two genera. The question which remains is whether or not *Apternodus*, because of its specializations, should be removed from the family Solenodontidae and placed in a separate family, the Apternodontidae. To be sure, the development of the auditory plates in *Apternodus* is a striking specialization. This character, however, probably was primarily coincident with a fossorial habitus. Specialization of the incisor teeth is more generally the rule rather than the exception, not only among zalambdodonts but among all of the Insectivora. It is not surprising, therefore, that the incisors of *Apternodus* are specialized. What is outstanding, however, is that this form has selected the reduction of I_2 and the probable loss of I^2. Despite the fact that *Apternodus* is distinctive in these two characters, I am of the opinion that since, in the less variable structures of the skull, it is so strikingly similar to *Solenodon* it should for the present at least retain its position under the family Solenodontidae.

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